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NOTES ON THE SHARKS AND RAYS OF CAPE  
LOOKOUT, N. C.

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In this paper I briefly record some observations made on the sharks and rays which occur in this field. Four species of sharks, *Ginglymostoma cirratum*, *Galeocerdo tigrinus*, *Carcharodon carcharias*, and *Cetorhinus maximus*, have not previously been reported. During fourteen years' fishing in this field I have added twelve of the thirty-one species listed in this paper to local fauna. I am indebted to Mr. Lewis Radcliffe, of the U. S. Bureau of Fisheries, for many suggestions in the preparation of the paper.

1. ***Ginglymostoma cirratum*** (Gmelin).

NURSE SHARK.

In the summer of 1913, while working in the breakers off the Lookout Shoals for sharks and rays, I noticed a large school of very dark-colored sharks drifting with the tide. These I at first mistook for sand-bar sharks. I soon had a nine-foot specimen hooked and in a short time brought it alongside. The lance with which it was struck rebounded from its tough hide and only after it had been freshly filed to a very sharp point could it be used to kill the shark. The head only was preserved. This is the first record of this species for the coast of North Carolina.

2. ***Mustelus canis*** (Mitchill).

SMOOTH DOGFISH.

Abundant during May and June; occasionally taken during July.

3. ***Galeocerdo tigrinus*** Müller & Henle.

In the latter part of June, 1912, a specimen was taken in the bight of Cape Lookout, which from a personal examination of the teeth and the

description of its color markings and general appearance as described by those who saw it, I am assured was this species. This form has not heretofore been recorded on the North Carolina coast.

#### 4. *Carcharhinus acronotus* (Poey).

SHARP-BACKED SHARK.

The first record of this rare shark for the coast of the United States was a specimen, three feet long, taken by me in the bight of Cape Lookout in July, 1911. During July, 1914, I captured six specimens in the bight of Cape Lookout.

#### 5. *Carcharhinus lamia* (Rafinesque).

CUB-SHARK.

Of this shark I have secured three specimens, one each for the years 1902, 1906, and 1913. These are the only records for this species on the North Carolina coast. The one taken in 1902 was originally identified as *C. milberti*.

#### 6. *Carcharhinus limbatus* (Müller & Henle).

In July, 1910, I had the good fortune to add this shark to the fauna of North Carolina.

#### 7. *Hypoprion brevirostris* Poey.

This shark, which had first been recorded in this field by Mr. Lewis Radcliffe in 1912, was first seen by the writer during the latter part of July, 1913. I succeeded in capturing two examples on Lookout Shoals, one containing early embryos.

#### 8. *Scoliodon terræ-novæ* (Richardson).

SHARP-NOSED SHARK.

With the exception of a short period during the winter and spring, this small shark is very abundant in this region.

#### 9. *Sphyrna tiburo* (Linnæus).

BONNET-NOSED SHARK.

This shark is fairly abundant from June first to October, but not so common as the hammer-head.

#### 10. *Sphyrna zygaena* (Linnæus).

HAMMER-HEADED SHARK; HAMMER-HEAD.

Contrary to the opinion of former writers, this is one of the most abundant sharks in this region during the summer months. On one occasion I hauled to the beach in a large seine, sixty-five specimens of this shark, averaging about four feet in length. In 1910 I captured a female which was  $14\frac{1}{4}$  feet in length. After capture this fish gave birth to five young

ones averaging 29 inches in length. I have often captured these fish with rod and reel and find them very game fighters.

**11. *Alopias vulpes* (Gmelin).**

WHIP-TAIL SHARK; THRESHER SHARK.

The first example of this species in this region was recorded by Mr. Lewis Radcliffe in April, 1913. Late in July, 1914, I saw a shark of this easily identifiable species in the bight of Cape Lookout. Although I was very close to it, I did not have my harpoons at hand and could not capture it. At the time of observation, it was feeding in shallow water by throwing the fish to its mouth with its tail, and I saw one fish, which it failed to seize, thrown for a considerable distance, clear of the water.

**12. *Carcharias littoralis* (Mitchill).**

SAND-BAR SHARK.

Not a regular habitant of this field. They occasionally arrive in large schools, especially on the shoals extending out beyond Cape Lookout, where they prove very troublesome to the blue-fish fishermen. This shark works in a more systematic way in securing its food than any shark of which I know. On one occasion I saw a school of a hundred or more surround a school of blue-fish and force them into a solid mass in shallow water, and then at the same instant the entire school of sharks dashed in on the blue-fish. On another occasion with a large school of blue-fish in my net, a school of these sharks attacked it from all sides and ate or liberated the school of blue-fish, practically ruining the net. Again in July, 1914, on Lookout Shoals, I had a large net filled with blue-fish attacked by a school of about 200 of these vicious sharks and the net ruined. I killed about twenty of them with harpoon and lance. Their average length was slightly in excess of eight feet. Several of those examined contained many eggs and embryos of length of over nine inches.

**13. *Carcharodon carcharias* (Linnæus).**

GREAT WHITE SHARK; MAN-EATER.

In 1905, while out in a small skiff, harpooning turtles, a huge shark of more than twenty feet in length appeared alongside, within reach of my hand. It apparently had no fear of us, as it struck the side of the skiff with some force. It then swam away for a distance of several hundred yards, then turned and swam rapidly toward us. I was about to fire into it as a large logger-head turtle arose to the surface and was attacked by the shark. The shark seized the turtle in its jaws and both disappeared beneath the surface. The next day I harpooned this turtle and found the upper shell for a width of nearly thirty inches showing the marks of the shark's teeth. The edge of the shell and the right hind flipper had been torn away. In 1913 I observed three of these sharks and succeeded in harpooning them, but my tackle was too light to hold them. While I was unable to positively identify these sharks, I believe they were man-eaters.

14. *Cetorhinus maximus* (Gunner).

BASKING SHARK.

In July, 1905, while trolling out from Cape Lookout, what was mistaken for a whale was espied lying apparently motionless on the surface of the water. As we approached it it became apparent that it was a shark and of a length in excess of forty feet. When within twenty yards of it, as I was preparing to strike with the harpoon, it suddenly disappeared. About the same time a fish of this size was sighted by native fishermen, three miles off the sea buoy on Beaufort bar, and was probably the same example.

15. *Squalus acanthias* Linnæus.

BONE SHARK.

This shark is very abundant around Cape Lookout in April and first week of May. I have taken two specimens on the first of January on the rocks off New River Inlet.

16. *Squatina squatina* (Linnæus).

JAKIE.

This species is a regular visitor at Cape Lookout, arriving the latter part of March and leaving about the first of May. For a short period it is quite abundant.

17. *Pristis pectinatus* Latham.

SAWFISH.

An annual visitor at Cape Lookout in small numbers only. It is usually found in the breakers of Lookout Shoals. I have observed no small examples of this fish, none of the nine specimens handled by me being under  $12\frac{1}{2}$  feet.

18. *Rhinobatus lentiginosus* Garman.

GUITAR FISH.

Exceedingly rare. In fourteen years I have captured only four specimens, as follows: two, females, 30 inches in length, taken July 23, 1912; a male  $17\frac{1}{2}$  inches in length, taken July 27, 1912; and an example  $21\frac{3}{4}$  inches long, taken in July, 1913.

19. *Raja lævis* (Mitchill).

SMOOTH SKATE.

Captures of this large skate in this field are exceedingly rare. I have taken them with a width of four feet, on the rocks far off shore, early in January, and believe that when the value of off-shore winter fishing is more fully appreciated they will be found in much greater numbers.

20. *Raja eglanteria* Bosc.

CLEAR-NOSE; BRIER RAY.

This ray is quite abundant around Cape Lookout from the middle of April to the middle of May. I have one record for July.

21. *Narcine brasiliensis* (Ölfers).

SMALL ELECTRIC RAY; SHOCK FISH.

In 1909 it was my good fortune to add this interesting electric ray to this region, as well as to the east coast of the United States. During each succeeding year I have noted that this fish arrives in the bight of Cape Lookout on the night of June 29, and departs on the night of July 4. It is seen in this region at no other time during the year.

22. *Urolophus jamaicensis* (Cuvier).

In June, 1911, I captured a small example of this West Indian ray at Cape Lookout. This species had not previously been reported as occurring on this coast.

23. *Dasyatis hastata* (Dekay).

STING RAY.

In July, 1910, at Cape Lookout, I captured a 64-pound female, which gave birth to five young rays while she was being killed. This species had not previously been reported as occurring on this coast.

24. *Dasyatis say* (Le Sueur).

STING RAY.

The commonest of all the sting rays in this region. It can be found there from the first of May till November.

25. *Pteroplatea maclura* (Le Sueur).

SAND SKATE; BUTTERFLY RAY.

This ray is very common in this region. Most of the specimens seen are less than a foot in width. I have occasionally seen individuals more than  $2\frac{1}{2}$  feet in width.

26. *Pteroplatea altavela* (Linnaeus).

A new addition to the fauna of North Carolina, and the first definite record for North America, was made on May 22, 1914, by the capture of a large female of this species near Cape Lookout. The width of the disc of this specimen was six feet ten inches. It was captured by Mr. Charles W. Willis, the captain of my boat and member of crew. From this specimen four well-developed embryos were taken; the largest had a width of  $17\frac{1}{2}$  inches and the smallest 15 inches. All had well-developed spines on the tails.

I was informed later by a native fisherman that at about the same date he caught in his seine in the bight of Cape Lookout, two large rays, which he described as follows: "They were the biggest sand skates that I ever saw and they had stings on their tails." I am convinced that the North Carolina coast was at that time visited by a school of these rays.

27. **Aëtobatus narinari** (Euphrasen).

SPOTTED STING RAY; LADY SKATE.

This species visits the Cape Lookout region in considerable numbers. I have killed as high as fifty in a single season, some of them of large size, the largest being 12 feet in length and 7 feet 7 inches broad.

28. **Myliobatis freminvillei** Le Sueur.

EAGLE RAY.

Never abundant, but I observe a few examples each year. I have noted that this species gives birth to its young in pairs of two folded together with head and tail in reverse position, there being three pairs.

29. **Rhinoptera bonasus** (Mitchill).

COW-NOSED RAY.

This ray is not abundant. I rarely see more than a half dozen specimens in a single season, and some years I have seen none at all.

30. **Mobula ölfersi** (Müller & Henle).

SMALL DEVILFISH.

In July, 1910, I first captured this rare and practically unknown devilfish which had not previously been reported on this coast. Each year I have recorded the time of their arrival and find the dates to be the same. They first arrive in the bight of Cape Lookout on the night of July 6, leave during the night of July 9, and return again on the night of July 24, leaving during the night of the 29th. They are later seen for some days, playing on Lookout Shoals. They are seen at no other season of the year. During the past four years I have captured nearly fifty of them, yet they appear to arrive in about the same number each year, in a school of about 100.

31. **Manta birostris** (Walbaum).

DEVILFISH.

In July, 1909, I saw one of these rays, having a width of at least twenty feet, leap from the water. In less than a minute it leaped the second time, its form and the two cephalic appendages being plainly visible.